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AUTHOR Resnick, Heidi S.; And Others
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ABSTRACT

Log-linear chi-square analyses were conducted to examine potential interactions between presence of pre-crime Axis I psychiatric diagnoses and differential levels of crime stress in association with posttraumatic stress disorder (PTSD) in a community sample of 295 female crime victims. High crime stress was defined as crime that included either perceived life threat, actual injury, or completed rape. Crime stress level was significantly associated with PTSD post-crime. Thirty-five percent of subjects with high crime stress exposure met criteria for PTSD, as opposed to 13% of those with low crime stress exposure. Pre-crime diagnosis was not associated with high crime stress exposure, indicating that this is not a vulnerability factor for exposure to crime characteristics associated with increased rates of PTSD. There were no significant independent associations between pre-crime Axis I diagnoses and PTSD post-crime. However, a significant interaction was observed between crime stress level, pre-crime depression, and PTSD, such that rate of PTSD was substantially higher in association with pre-crime depression, only in the high crime stress exposure group. Major findings are consistent with previous results implicating trauma exposure as the primary factor in development of PTSD. However, the results suggest that pre-crime depression may constitute a vulnerability factor for development of PTSD under conditions of high crime stress exposure. (Author)

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Vulnerability-Stress Factors in Development of Post-Traumatic Stress Disorder

Heidi S. Resnick, Ph.D.

Dean G. Kilpatrick, Ph.D.

Teresa L. Kramer, Ph.D.

Connie L. Best, Ph.D.

Crime Victims Research and Treatment Center

Medical University of South Carolina

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Log-linear chi-square analyses were conducted to examine potential interactions between presence of pre-crime Axis I psychiatric diagnoses and differential levels of crime stress in association with posttraumatic stress disorder (PTSD) in a community sample of 295 female crime victims. High crime stress was defined as crime that included either perceived life threat, actual injury, or completed rape. Crime stress level was significantly associated with PTSD post-crime. Thirty five percent of subjects with high crime stress exposure met criteria for PTSD, as opposed to 13% of those with low crime stress exposure. Pre-crime diagnosis was not associated with high crime stress exposure, indicating that this is not a vulnerability factor for exposure to crime characteristics associated with increased rates of PTSD. There were no significant independent associations between pre-crime Axis I diagnoses and PTSD post-crime. However, a significant interaction was observed between crime stress level, pre-crime depression, and PTSD, such that rate of PTSD was substantially higher in association with pre-crime depression, only in the high crime stress exposure group. Major findings are consistent with previous results implicating trauma exposure as the primary factor in development of PTSD. However, the results indicate that pre-crime depression may constitute a vulnerability factor for development of PTSD under conditions of high crime stress exposure.

Specific characteristics of stressors associated with increased likelihood of PTSD have been identified across a range of research areas including combat, disaster, and criminal assault (Green, in press). Variables identified include threat to life or physical integrity, physical injury, receipt of intentional harm, exposure to grotesque sights, and violent or sudden death of a loved one.

Despite progress in the identification of these specific exposure characteristics, the role of individual differences in response to trauma has yet to be examined thoroughly. Recent findings indicate that personological variables such as pre-trauma conduct disorder (Helzer, Robins, & McEvoy, 1987), and sociodemographic characteristics (Kulka et al., 1988) may be associated with both increased likelihood of exposure to traumatic events, and increased vulnerability for development of disorder, given trauma exposure.

Thus, an important topic of current research relates to the role of potential mediating factors that may contribute to a range of adaptation following differential exposure to qualitative aspects of stressors associated with increased risk of PTSD that have been identified across trauma areas.

The purpose of the present study was to examine the potential relationships between pre-crime psychiatric diagnoses, specific crime stress characteristics, and PTSD following criminal victimization in a community sample. Specific models of direct and/or interactive effects of pre-crime and crime characteristics were tested using log-linear analyses.

Pre- and post-crime diagnoses were assessed retrospectively in reference to subjects' first criminal victimization. In addition, based on previous findings, (Kilpatrick, et al., 1989), the presence of perceived life threat, injury, or completed rape as components of the initial victimization were examined to differentiate between high and low crime-stress exposure.

Four models of potential mediating relationships between pre-crime psychopathology and stress level in association with PTSD were tested. The first model was labelled the indirect association hypothesis. Under this model, pre-crime diagnoses are hypothesized as having an indirect effect on PTSD liklihood by producing an increased risk of experiencing high crime stress.

The three remaining models were derived from a multivariate strategy, employed in the stressful life events literature to examine the role of mediating variables in association with stress (Cooke, 1985), and adapted for study of etiological factors in development of PTSD (Foy, Osato, Houskamp, & Neumann, in press). These models are defined specifically here in reference to the hypotheses tested in the present study.

Under the second model, labelled the vulnerability hypothesis, exposure to stress is independently capable of producing distress, while additional mediating factors interact with stress exposure to heighten distress, but are not independently capable of producing distress. Under this model presence of pre-crime diagnosis by itself would not be predicted to be significantly associated with development of PTSD under low crime stress exposure conditions. However, there should be an interaction between pre-crime diagnosis

and high crime stress exposure, such that risk of PTSD would be increased, beyond the effects of high stress exposure itself.

A third model was the independent causes hypothesis. This model applies to the situation in which both factors have independent effects in association with the outcome variable, and there are no interactive effects. Under this model, level of crime stress exposure and pre-crime diagnosis should be significantly associated with development of PTSD, but there should be no interactions between the pre-crime diagnosis and crime stress factors in association with rates of PTSD.

The final model proposed by Cooke (1985) was termed the synergy hypothesis. Under this model both stress exposure and other mediating variable/s are independently associated with distress, and there is a significant interaction such that resultant distress is heightened. Thus, this model would be supported in cases in which both pre-crime diagnosis and crime stress level exposure were significantly associated with PTSD, and there was a significant interaction between pre-crime and crime stress factors in association with PTSD.

Methods

Subjects: The 295 female participants, who had all been identified as victims of at least one crime during their lifetimes, were a subset of a larger representative sample of adult (age 18 or greater) female residents of Charleston County, South Carolina. The methodology of the parent study is described elsewhere (Kilpatrick, Best, Veronen, Amick, Villeponteaux, & Ruff, 1985). Mean age in the group was 40.76 years. Seventy three percent of

the subjects were white, and 63.4% were married. The majority of subjects had at least a high school education, and modal yearly income was $15,000 to $25,000.

Assessment Instruments: The assessment battery consisted of two structured interview schedules, the Incident Report Interview (IRI) and a modified version of the Diagnostic Interview Schedule (DIS) (Robins, Helzer, Croughan & Ratcliff, 1981).

Assessment of crime characteristics: The IRI is a highly structured, behaviorally specific interview schedule designed to screen for and detect incidents of serious criminal victimization that had occurred in a respondent's lifetime. Data was gathered for a possible history of up to three separate crime incidents. The analyses conducted here related only to subjects' first or only crime.

A separate incident characteristics section of the interview collected detailed information about each crime, including information about: (a) if the victim sustained a physical injury, and (b) if the victim's cognitive appraisal was that the incident posed a threat of death or serious injury.

For the purposes of this study victimization experiences were defined as high stress crimes if: (a) the first or only crime experienced met the behavioral definition of rape; (b) the subject had suffered physical injury during the first or only crime, or (c) the subject reportedly feared death or serious harm during the first or only victimization experienced. Victimization experiences were classified as low stress if non of these criteria were met for the first or only victimization.

Assessment of Psychiatric History: The second interview instrument used was a modified version of the Diagnostic Interview Schedule (DIS). It was administered by clinical psychologists, clinical social workers, or clinical psychology interns trained in its use. The DIS responses allowed for determination of whether respondents currently met or had ever met over their lifetime, DSM-III diagnostic criteria for the following mental health disorders: (a)major depressive episode; (b) agoraphobia/panic disorder; (c)social/simple phobia; (d) obsessive-compulsive disorder, and (e)post-traumatic stress disorder.

The time frame for order of occurrence of psychiatric disorder in relation to each victimization was assessed in the crime victim group. Subjects who met lifetime criteria for any of the non-PTSD individual disorders were asked if the disorder was present before, after, or both pre- and post-crime in specific reference to their first crime. Subjects who met lifetime criteria for PTSD were asked if the disorder was present following their first crime.

Obsessive-compulsive disorder was not examined individually, as it was only present pre-crime in two subjects. In addition to individual diagnostic categories, the category any diagnosis was examined and was defined as presence of major depressive episode, agoraphobia/panic disorder, social/simple phobia, or obsessive-compulsive disorder.

Results

Of the 295 crime victims, 62 (21%) had developed PTSD following the initial victimization. One hundred eighty six women (63%) had been exposed to low crime stress, while 109 (37%) had

been exposed to high crime stress. The distribution of subjects in each of the crime stress level by pre-crime diagnostic category groupings is displayed in Table 1.

Hierarchical log-linear chi-square analyses were conducted separately for each pre-crime diagnosis to examine potential associations between specific pre-existing condition, crime stress level, and presence of PTSD post-crime. The rates of PTSD post-crime in each of the four subgroups (pre-existing condition: yes/no X crime stress level: high/low) are presented in Table 2.

The results indicated that in the case of pre-crime depression, the third order interaction, that included the variables of pre-crime condition, stress level, and PTSD, was the best fitting model. The chi-square change value associated with the elimination of that effect was $X^2_{(1)} = 5.20$, $p < .05$. In terms of the partial chi-square values associated with lower order effects, only the association between crime-stress level and PTSD was significant, $X^2_{(1)} = 19.44$, $p < .0005$. The relationship between the three variables is depicted in Figure 1.

In the case of all other models tested, the best model of fit was the two way interaction of crime stress level X PTSD. The associated likelihood ratio chi-square change value was, $X^2_{(1)} = 19.36$, $p < .0005$. The rate of PTSD in the high crime stress group was 35%. The rate of PTSD in the low crime stress group was 13%. Partial association chi-square values associated with the second order interactions, pre-crime condition X crime stress level and pre-crime condition X PTSD, were all non-significant.

Discussion

The results failed to support the model of indirect association between pre-crime psychopathology and PTSD. No significant associations were observed between presence of any Axis I diagnosis and the crime stress characteristics of presence of rape, life threat, or injury during initial victimization. Thus, those with pre-crime diagnoses did not appear to be at higher risk of exposure to specific crime characteristics that have been associated with increased risk of PTSD.

The finding of a significant independent association between crime stress level exposure and PTSD is consistent with findings obtained in the combat related PTSD literature, that indicate a primary role for degree of combat exposure in development of PTSD (Foy, Sipprelle, Rueger, & Carroll 1984; Kulka et al., 1988).

With regard to the mediation hypotheses outlined in the introduction, only in the case of pre-crime depression, was a mediation effect observed. The relationships observed between crime stress level, pre-crime depression, and PTSD supported the vulnerability hypothesis. Thus, crime stress level was significantly associated with PTSD, while pre-crime depression was not independently associated with PTSD. In addition, there was a significant interaction between pre-crime depression and crime stress level in association with PTSD. The results indicated that those with pre-crime depression were not more vulnerable to developing PTSD in the absence of high crime stress exposure factors, but the presence of pre-crime depression appeared to heighten the reaction to high crime stress exposure.

It is important to note that pre-crime depression was the only

condition for which this relationship was observed. This highlights the importance of specifying the variables that are being examined as potential mediators of outcome in terms of PTSD. Other pre-crime conditions examined here were not associated with increased rates of PTSD regardless of level of exposure. However, it may be the case that other individual variables not examined in this study do exert additive or synergistic effects, such that rates of distress are elevated under low stress exposure conditions.

Limitations of the present study include the retrospective nature of assessment of mental health functioning in association with timing of initial victimization, and small sample size, as well as absence of other potentially important variables such as other life stressors and social support. Studies that employ prospective longitudinal assessment of a variety of indices of individual functioning that may modify effects of exposure to a variety of stressor experiences would be optimal to further address the relationships between these potential mediating variables in association with PTSD following differential trauma exposure.

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Table 1

Number and Percentage of Crime Victims with or without Pre-existing Diagnoses By Stress Level

Pre-existing Diagnosis	Yes				No			
Crime Stress Level	Low		High		Low		High	
Pre-existing Diagnosis	N	%	N	%	N	%	N	%
Depression	11	3.7	7	2.4	175	59.3	102	34.6
Phobias	39	13.2	21	7.1	147	49.8	86	29.2
Agoraphobia-panic	6	2.0	6	2.0	180	61.0	103	34.9
Any diagnosis	51	17.3	29	9.8	135	45.8	80	27.1

Table 2

Presence PTSD Diagnosis Post-crime X Pre-existing Diagnosis and Stress Level

Pre-existing Diagnosis	Yes		No			
Crime Stress Level	Low	High	Low	High	a	b
Pre-existing Diagnosis						
Depression	9%	86%	13%	31%	**	*
Phobias	15%	48%	12%	32%	**	
Agoraphobia-panic	17%	50%	13%	34%	**	
Any diagnosis	14%	52%	13%	29%	**	

* $p < .05$; ** $p < .0005$

Note 1: a = chi-square stress x PTSD

Note 2: b = chi-square stress X pre-crime diagnosis X PTSD

PRE-CRIME DEPRESSION X CRIME STRESS X PTSD